



## General

### Guideline Title

Risk assessment and prevention of pressure ulcers: a clinical practice guideline from the American College of Physicians.

### Bibliographic Source(s)

Qaseem A, Mir TP, Starkey M, Denberg TD, Clinical Guidelines Committee of the American College of Physicians. Risk assessment and prevention of pressure ulcers: a clinical practice guideline from the American College of Physicians. *Ann Intern Med.* 2015 Mar 3;162(5):359-69. [120 references] [PubMed](#)

### Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

## Recommendations

### Major Recommendations

Definitions for the overall quality of evidence (high, moderate, low, or insufficient evidence to determine net benefits or risks) and the strength of the recommendations (strong, weak) are provided at the end of the "Major Recommendations" field.

**Recommendation 1:** American College of Physicians (ACP) recommends that clinicians should perform a risk assessment to identify patients who are at risk of developing pressure ulcers. (Grade: weak recommendation, low-quality evidence)

Risk assessment is often part of bundled care and multicomponent interventions for preventing pressure ulcers. Risk factors for pressure ulcers include older age; black race or Hispanic ethnicity; lower body weight; cognitive impairment; physical impairments; and other comorbid conditions that affect soft tissue integrity and healing, such as urinary or fecal incontinence, diabetes, edema, impaired microcirculation, hypoalbuminemia, and malnutrition. Clinicians should make individualized decisions based on risk assessment on whether to use a single or multicomponent intervention to prevent pressure ulcers in patients.

The current evidence does not conclusively show a difference between clinical judgment and risk assessment scales in reducing pressure ulcer incidence. However, tools may be especially useful for clinicians without expert gestalt. Moderate-quality evidence showed that the Braden, Cubbin and Jackson, Norton, and Waterlow scales can predict which patients are more likely to develop a pressure ulcer, and all of these instruments have low sensitivity and specificity. In addition, moderate-quality evidence showed that the diagnostic accuracies of the scales do not differ substantially. No study evaluated the effectiveness of risk assessment tools across care settings or patient subgroups.

**Recommendation 2:** ACP recommends that clinicians should choose advanced static mattresses or advanced static overlays in patients who are at

an increased risk of developing pressure ulcers. (Grade: strong recommendation, moderate-quality evidence)

Moderate-quality evidence showed that the use of advanced static mattresses or overlays was associated with a lower risk for pressure ulcers compared with standard hospital mattresses, and no brand was shown to be superior. Advanced static mattresses and overlays are also less expensive than alternating-air or low-air-loss mattresses and can be used as part of a multicomponent approach to pressure ulcer prevention.

Recommendation 3: ACP recommends against using alternating-air mattresses or alternating-air overlays in patients who are at an increased risk of developing pressure ulcers. (Grade: weak recommendation, moderate-quality evidence)

The current evidence does not show a clear benefit for pressure ulcer prevention using alternating-air beds and overlays compared with static mattresses and overlays, and alternating-air beds and overlays are associated with significantly higher costs. Lower-cost support surfaces should be the preferred approach to care.

#### Definitions:

#### Grading of Quality of Evidence

**High-Quality Evidence:** Evidence is considered high quality when it is obtained from 1 or more well-designed and well-executed randomized, controlled trials (RCTs) that yield consistent and directly applicable results. This also means that further research is very unlikely to change confidence in the estimate of effect.

**Moderate-Quality Evidence:** Evidence is considered moderate quality when it is obtained from RCTs with important limitations—for example, biased assessment of the treatment effect, large loss to follow-up, lack of blinding, unexplained heterogeneity (even if it is generated from rigorous RCTs), indirect evidence originating from similar (but not identical) populations of interest, and RCTs with a very small number of participants or observed events. In addition, evidence from well-designed controlled trials without randomization, well-designed cohort or case-control analytic studies, and multiple time series with or without intervention are in this category. Moderate-quality evidence also means that further research will probably have an important effect on confidence in the estimate of effect and may change the estimate.

**Low-Quality Evidence:** Evidence obtained from observational studies would typically be rated as low quality because of the risk for bias. Low-quality evidence means that further research is very likely to have an important effect on confidence in the estimate of effect and will probably change the estimate. However, the quality of evidence may be rated as moderate or even high, depending on circumstances under which evidence is obtained from observational studies. Factors that may contribute to upgrading the quality of evidence include a large magnitude of the observed effect, a dose-response association, or the presence of an observed effect when all plausible confounders would decrease the observed effect.

**Insufficient Evidence to Determine Net Benefits or Risks:** When the evidence is insufficient to determine for or against routinely providing a service, the recommendation was graded as "insufficient evidence to determine net benefits or risks." Evidence may be conflicting, of poor quality, or lacking, and hence the balance of benefits and harms cannot be determined. Any estimate of effect that is very uncertain as evidence is either unavailable or does not permit a conclusion.

#### The American College of Physicians' Guideline Grading System\*

Quality of Evidence	Strength of Recommendation	
	Benefits Clearly Outweigh Risks and Burden or Risks and Burden Clearly Outweigh Benefits	Benefits Finely Balanced With Risks and Burden
High	Strong	Weak
Moderate	Strong	Weak
Low	Strong	Weak
Insufficient evidence to determine net benefits or risks		

\*Adopted from the classification developed by the GRADE (Grading of Recommendations Assessment, Development, and Evaluation) workgroup.

## Clinical Algorithm(s)

None provided

## Scope

### Disease/Condition(s)

Pressure ulcers

### Guideline Category

Prevention

Risk Assessment

### Clinical Specialty

Family Practice

Geriatrics

Internal Medicine

Nursing

Preventive Medicine

### Intended Users

Advanced Practice Nurses

Dietitians

Hospitals

Nurses

Physical Therapists

Physician Assistants

Physicians

### Guideline Objective(s)

To present the available evidence on the comparative effectiveness of various risk assessment instruments and benefits and harms of strategies to prevent pressure ulcers

### Target Population

All adults at risk for pressure ulcers

### Interventions and Practices Considered

1. Risk assessment to identify patients who may develop pressure ulcers
2. Advanced static mattresses or advanced static overlays
3. Alternating-air mattresses or alternating-air overlays (not recommended)

## Major Outcomes Considered

- Pressure ulcer incidence and severity
- Resource use (including duration of hospital stay or cost)
- Diagnostic accuracy (sensitivity, specificity, and positive and negative likelihood ratios)
- Measures of risk (hazard ratios, odds ratios, and relative risks)
- Discrimination (area under the receiver-operating characteristic curve)
- Harms (dermatologic reactions, discomfort, and infection)

## Methodology

### Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

### Description of Methods Used to Collect/Select the Evidence

Note from the National Guideline Clearinghouse (NGC): A systematic evidence review was prepared by the Oregon Evidence-based Practice Center (EPC) (see the "Availability of Companion Documents" field).

The investigators searched MEDLINE (1946 through February 2014), CINAHL (1998 through February 2014), the Cochrane Library, clinical trials registries, and reference lists to identify trials published in English. The outcomes evaluated for this guideline include pressure ulcer incidence and severity; resource use (including duration of hospital stay or cost); diagnostic accuracy sensitivity, specificity, and positive and negative likelihood ratios); measures of risk (hazard ratios, odds ratios, and relative risks); discrimination (area under the receiver-operating characteristic curve); and harms, such as dermatologic reactions, discomfort, and infection.

The investigators also supplemented the Agency for Healthcare Research and Quality (AHRQ) evidence review with another systematic evidence review of multicomponent strategies for preventing pressure ulcers that examined the importance of contextual aspects of programs that aim to reduce facility-acquired pressure ulcers. This review included implementation studies (from 2000 to September 2012) of multicomponent initiatives to prevent pressure ulcers in adults in U.S. acute and long-term care settings. Studies were limited to those that reported pressure ulcer rates at least 6 months after implementation of the intervention.

Further details about the methods and inclusion and exclusion criteria applied in the evidence review are available in the full AHRQ report and the Supplement (see the "Availability of Companion Documents" field).

### Number of Source Documents

Sixty-seven studies were included in the systematic review:

- Effectiveness of risk assessment instruments in reducing pressure ulcer incidence: 3
- Effectiveness of preventive interventions: 62 (63 publications)\*
- Harms of preventive interventions: 16\*

\*Some studies are included for >1 key question.

# Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

## Rating Scheme for the Strength of the Evidence

### Grading of Quality of Evidence

**High-Quality Evidence:** Evidence is considered high quality when it is obtained from 1 or more well-designed and well-executed randomized, controlled trials (RCTs) that yield consistent and directly applicable results. This also means that further research is very unlikely to change confidence in the estimate of effect.

**Moderate-Quality Evidence:** Evidence is considered moderate quality when it is obtained from RCTs with important limitations—for example, biased assessment of the treatment effect, large loss to follow-up, lack of blinding, unexplained heterogeneity (even if it is generated from rigorous RCTs), indirect evidence originating from similar (but not identical) populations of interest, and RCTs with a very small number of participants or observed events. In addition, evidence from well-designed controlled trials without randomization, well-designed cohort or case-control analytic studies, and multiple time series with or without intervention are in this category. Moderate-quality evidence also means that further research will probably have an important effect on confidence in the estimate of effect and may change the estimate.

**Low-Quality Evidence:** Evidence obtained from observational studies would typically be rated as low quality because of the risk for bias. Low-quality evidence means that further research is very likely to have an important effect on our confidence in the estimate of effect and will probably change the estimate. However, the quality of evidence may be rated as moderate or even high, depending on circumstances under which evidence is obtained from observational studies. Factors that may contribute to upgrading the quality of evidence include a large magnitude of the observed effect, a dose–response association, or the presence of an observed effect when all plausible confounders would decrease the observed effect.

**Insufficient Evidence to Determine Net Benefits or Risks:** When the evidence is insufficient to determine for or against routinely providing a service, the recommendation was graded as "insufficient evidence to determine net benefits or risks." Evidence may be conflicting, of poor quality, or lacking, and hence the balance of benefits and harms cannot be determined. Any estimate of effect that is very uncertain as evidence is either unavailable or does not permit a conclusion.

## Methods Used to Analyze the Evidence

### Systematic Review with Evidence Tables

## Description of the Methods Used to Analyze the Evidence

Note from the National Guideline Clearinghouse (NGC): A systematic evidence review was prepared by the Oregon Evidence-based Practice Center (EPC) (see the "Availability of Companion Documents" field).

### Data Extraction

One investigator abstracted details about the study design, population, setting, interventions, analysis, follow-up, and results. A second investigator reviewed data for accuracy. Two investigators independently applied predefined criteria (16 to 18) to assess the quality of each study as good, fair, or poor. Discrepancies were resolved through consensus.

For studies of interventions, the investigators abstracted relative risks (RRs) and associated 95% confidence intervals (CIs) or calculated them on the basis of the pressure ulcer incidence in each intervention group.

### Data Synthesis and Analysis

The investigators did not conduct meta-analysis because of methodological limitations in the studies and clinical heterogeneity. They assessed the overall strength of each body of evidence as high, moderate, low, or insufficient in accordance with the Agency for Healthcare Research and Quality (AHRQ) Methods Guide for Effectiveness and Comparative Effectiveness Reviews, on the basis of the quality of studies, consistency among studies, precision of estimates, and directness of evidence.

# Methods Used to Formulate the Recommendations

Expert Consensus

## Description of Methods Used to Formulate the Recommendations

Note from the National Guideline Clearinghouse (NGC): A systematic evidence review was prepared by the Oregon Evidence-based Practice Center (EPC) (see the "Availability of Companion Documents" field).

This guideline is based on a systematic evidence review, an update of the literature (see the Supplement), and an evidence report sponsored by the Agency for Healthcare Research and Quality (AHRQ) (see the "Availability of Companion Documents" field) that addressed the following key questions:

- 1. Is the use of risk assessment tools effective in reducing the incidence or severity of pressure ulcers, and how does effectiveness vary according to setting and patient characteristics?
- 2. How do various risk assessment tools compare with one another in their ability to predict the incidence of pressure ulcers?
- 3. In patients at increased risk for pressure ulcers, what is the effectiveness and comparative effectiveness of preventive interventions in reducing the incidence or severity of pressure ulcers, and how does effectiveness vary according to assessed risk level, setting, or patient characteristics?
- 4. What are the harms of interventions for preventing pressure ulcers? Do harms differ according to the type of intervention, setting, or patient characteristics?

This guideline rates the evidence and recommendations by using the American College of Physicians' (ACP's) guideline grading system (see the "Rating Scheme for the Strength of the Evidence" and "Rating Scheme for the Strength of the Recommendations" fields). Details of the guideline development process can be found in the ACP methods paper (see the "Availability of Companion Documents" field).

## Rating Scheme for the Strength of the Recommendations

The American College of Physicians' Guideline Grading System\*

Quality of Evidence	Strength of Recommendation	
	Benefits Clearly Outweigh Risks and Burden or Risks and Burden Clearly Outweigh Benefits	Benefits Finely Balanced With Risks and Burden
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\*Adopted from the classification developed by the GRADE (Grading of Recommendations Assessment, Development, and Evaluation) workgroup.

## Cost Analysis

The guideline developers reviewed published cost analyses.

## Method of Guideline Validation

Internal Peer Review

## Description of Method of Guideline Validation

This guideline was approved by the American College of Physicians (ACP) Board of Regents on July 26, 2014.

## Evidence Supporting the Recommendations

### Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

## Benefits/Harms of Implementing the Guideline Recommendations

### Potential Benefits

Moderate-quality evidence from a review of 26 implementation studies showed that multicomponent interventions can improve skin care and reduce pressure ulcer rates in both acute and long-term care settings. The review found that key components of successful interventions include simplification and standardization of pressure ulcer-specific interventions and documentation, involvement of multidisciplinary teams and leadership (including ostomy, continence, and other nurses and personnel), designated skin champions who educate staff about skin care and ulcer prevention, ongoing staff education (including team meetings and motivational campaigns), and sustained audit and feedback (including weekly prevalence reports, formal and informal feedback, and all-facility meetings). Successful interventions also incorporated evidence-based guidelines into their practices.

### Potential Harms

- Although details on specific harms related to individual interventions were sparse, no serious treatment-related harms were reported. See the section "Harms of Interventions to Prevent Pressure Ulcers" in the original guideline document for further information.
- The systematic review found no harms reported for the multicomponent strategies that were used to prevent pressure ulcers.

## Qualifying Statements

### Qualifying Statements

- Clinical practice guidelines are "guides" only and may not apply to all patients and all clinical situations. Thus, they are not intended to override clinicians' judgment. All American College of Physicians (ACP) clinical practice guidelines are considered automatically withdrawn or invalid 5 years after publication or once an update has been issued.
- The authors of this article are responsible for its contents, including any clinical or treatment recommendations.

## Implementation of the Guideline

### Description of Implementation Strategy

An implementation strategy was not provided.

### Implementation Tools

Mobile Device Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

## Institute of Medicine (IOM) National Healthcare Quality Report Categories

### IOM Care Need

Staying Healthy

### IOM Domain

Effectiveness

Patient-centeredness

## Identifying Information and Availability

### Bibliographic Source(s)

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### Adaptation

Not applicable: The guideline was not adapted from another source.

### Date Released

2015 Mar 3

### Guideline Developer(s)

American College of Physicians - Medical Specialty Society

### Source(s) of Funding

Financial support for the development of this guideline comes exclusively from the American College of Physicians (ACP) operating budget.

### Guideline Committee

Clinical Guidelines Committee of the American College of Physicians



## Composition of Group That Authored the Guideline

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## Financial Disclosures/Conflicts of Interest

Authors followed the policy regarding conflicts of interest described at [www.annals.org/article.aspx?articleid=745942](http://www.annals.org/article.aspx?articleid=745942) . Disclosures can be viewed at [www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=M14-1567](http://www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=M14-1567) . A record of conflicts of interest is kept for each Clinical Guidelines Committee meeting and conference call and can be viewed at [www.acponline.org/clinical\\_information/guidelines/guidelines/conflicts\\_cgc.htm](http://www.acponline.org/clinical_information/guidelines/guidelines/conflicts_cgc.htm) .

## Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

## Guideline Availability

Electronic copies: Available from the [Annals of Internal Medicine Web site](#) .

Print copies: Available from the American College of Physicians (ACP), 190 N. Independence Mall West, Philadelphia PA 19106-1572.

## Availability of Companion Documents

The following are available:

- Chou R, Dana T, Bougatsos C, Blazina I, Starmer AJ, Reitel K, Buckley DI. Pressure ulcer risk assessment and prevention: a systematic comparative effectiveness review. *Ann Intern Med*. 2013 Jul 2;159(1):28-38. Electronic copies: Available from the [Annals of Internal Medicine Web site](#) .
- Pressure ulcer risk assessment and prevention: update to a comparative effectiveness review. Supplement. 2015. 10 p. Electronic copies: Available from the [Annals of Internal Medicine Web site](#) .
- Chou R, Dana T, Bougatsos C, Blazina I, Starmer A, Reitel K, Buckley D. Pressure ulcer risk assessment and prevention: comparative effectiveness. Comparative effectiveness review no. 87. (Prepared by the Oregon Evidence-based Practice Center under Contract No. 290-2007-10057-I.) AHRQ Publication No. 12(13)-EHC148-EF. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2013 May. 358 p. Electronic copies: Available from the [Agency for Healthcare Research and Quality \(AHRQ\) Web site](#) .
- Qaseem A, Snow V, Owens DK, Shekelle P. The development of clinical practice guidelines and guidance statements of the American College of Physicians: summary of methods. *Ann Intern Med*. 2010 Aug 3;153(3):194-199. Electronic copies: Available from the [Annals of Internal Medicine Web site](#) .

Print copies: Available from the American College of Physicians (ACP), 190 N. Independence Mall West, Philadelphia PA 19106-1572.

A collection of Recommendation Summaries for all current American College of Physicians Clinical Guidelines is now available for mobile devices from the [ACP Web site](#) .

## Patient Resources

The following is available:

- Summaries for patients. Risk assessment and prevention of pressure ulcers. Ann Intern Med 2015 Mar 3;162(5):I-34. Electronic copies: Available from the [Annals of Internal Medicine Web site](#) .

Print copies: Available from the American College of Physicians (ACP), 190 N. Independence Mall West, Philadelphia PA 19106-1572.

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## NGC Status

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## Copyright Statement

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